THE Index is arranged according to subjects on the plan of the *Index du Répertoire Bibliographique* (published by MM. Gauthier-Villars, pp. 93, 2nd edition, 1898; about 2/-).

INDEX

TO THE

MATHEMATICAL GAZETTE

No. 61, JANUARY, 1907—No. 76, DECEMBER, 1908.

COMPILED BY MISS A. J. TEAL.

1. Addresses, Reports of Council, etc.
2. Articles.
3. Correspondence.
4. Mathematical Notes.
5. Reviews and Notices.
6. Queries and Answers.
7. Errata.
8. Solutions.

EXPLANATORY REMARKS.

IT is not possible to give in full the subjects under the thousand or so subdivisions which appear in the *Index*; but for the sake of those who do not possess the *Index* we give the subjects under the principal letters. This will amply suffice for the majority of our readers.

A. Algebra; Theory of Equations.
B. Determinants; Linear substitutions; Elimination; Invariants and Covariants; Complex Quantities.
C. Differential and Integral Calculus.
D. Theory of Functions; Algebra of Continued Fractions.
E. Definite Integrals. . . .
F. Elliptic Functions. . . .
G. Hyperelliptic Functions. . . .
H. Differential Equations . . . Finite Differences, Recurrent Series.
I. Arithmetic. Theory of Numbers.
J. Permutations and Combinations; Probabilities; Calculus of Variations. . . .

65783

K. Elementary Geometry and Trigonometry; Geometry of point, line, plane, circle, and sphere; Perspective; Descriptive Geometry.
L^1. Conics.
L^2. Quadrics.
M^1. Algebraical Plane Curves.
M^2. Algebraical Surfaces.
M^3. Algebraical Gauche Curves.
N. Complexes and Congruences; Connexes; Systems of curves and surfaces; Enumerative Geometry.
O. Infinitesimal and Kinematic Geometry.
P. Transformations; Homography; Homology; Polar Reciprocals.
Q. Geometry of n dimensions; non-Euclidean Geometry.
R. Kinematics; Statics; Dynamics.
S. Hydrostatics.
T. Mathematical Physics.
U. Astronomy.
V. Philosophy and History of Mathematics. Biography. Methodology.
X. Graphic Calculation.

ADDRESSES, REPORTS OF COUNCIL, ETC.

	Author.	Page.
Report of Council for 1906.		25
Meeting of the Association.		26
Preliminary Report of Scholarships Sub-Committee.		73
The Future of the Mathematical Association.	G. H. Bryan.	74
Report of the Teaching of Mathematics in Preparatory Schools.		137
Letter to Examining Bodies from the Mathematical Association Committee.		147
Report of Council, 1907.		218
Report of Committee on Course for University Entrance Scholarships.		219
Presidential Address, 1908.		221
Our Local Branch.		201, 217, 241, 273, 377
The Teaching of Mathematics in English Public Schools for Boys.	C. Godfrey.	250
The Neglected British Teacher.	G. H. Bryan.	28
The A, B, C of the Higher Analysis.	V. Ramaswami Aiyar.	79
An Interesting Find.	E. M. Langley.	97
Elementary Analysis at the British Association Meeting, 1907.		113
Should Elementary Teachers be Civil Servants?		217
The Study of Mathematics.	P. E. B. Jourdain.	306
An International Journal of Mathematics.		40
The Congress of Mathematicians.		96
The Indian Mathematical Club.		272

ARTICLES.

Type.	Title.	Author.	Page.
D. 1. c.	The Integral Calculus Theorem.	D. K. Picken.	5
D. 6. b.	On the Exponential Inequalities and the Exponential Function.	V. Ramaswami Aiyar.	8
D. 6. c.	The Geometrical Treatment of Trigonometrical Series.	F. W. Whipple.	273
I. 1.	On Binal Fractions.	Lt.-Col. Allan Cunningham, R.E.	259
I. 1.	A Method of Calculating Approximately High Powers and Roots of Numbers.	R. F. Muirhead.	302
I. 1.	On the Multiplication and Division of Decimals.	A. S. Grant.	321
I. 1.	Decimals.	W. G. Borchardt.	384
I. v. a.	The Introduction of Irrational Numbers.	P. E. B. Jourdain.	201
I. 1; v. a.	Contracted Multiplication.	F. Clarke.	99
I. 1; v. a.	The Elementary Arithmetic of the Theory of Numbers.	C. S. Jackson.	241
I. 5.	General Theory of Irrational Number.	(The late) E. Budden.	276
I. 8.	The Division of the Circle.	Camillo Manzitti.	377
K. 20.	Notes on the Groups of Subtraction and Division, and on the Hyperbolic Functions.	G. A. Miller.	381
K. 21. b.	Division of Angles and Arcs.	T. J. W. Whipple.	98
K. 23.	Perspective through the Stereoscope.	E. M. Langley.	115, 159
L^1. 12. c.	The Conic through Five given Points.	A. C. Dixon.	228
R.; V. a.	On some early Propositions of Statics.	W. E. Bryan.	386
R. 2.	Quadrature-Formulae in Relation to Moments.	W. F. Sheppard.	325
R. 6.: V. a.	The Principles of Dynamics.	W. Larden.	1
V. a.	The Teaching of Geometry.	J. G. Hamilton.	33
V. a.	A First Practical Training in Arithmetic.	Frances Epps.	77
V. a.	The Need of a Sequence in Geometry.	J. M. Child.	80
V. a.	Is there need of a Recognized Sequence in Geometry?	C. Godfrey.	100
V. a.	The Introduction of the Mathematical Idea of Infinity.	W. H. Young.	147
V. 8.	On Models of Space-Filling Solids.	W. Baily.	297
V. 8.	Models of Functions.	C. Elliott.	323

CORRESPONDENCE.

An Indian Mathematical Society.	V. Ramaswami Aiyar.	106
The Principles of Dynamics.	W. D. Evans.	93
The Line at Infinity.	W. D. Evans.	93
The Teaching of Geometry.	G. W. Greenwood.	93
Cricket and Dynamics.	Pedagogicus.	94

MATHEMATICAL NOTES.

Type.	No.	Subject.	Author.	Page.
A. 1. b.	274	Note on the Power Inequality.	F. J. W. Whipple.	318
A. 1. b.	276	On certain Algebraical Factors.	R. F. Davis.	327
A. 1. b.	283	Note on the Power Inequality.	E. J. Nanson.	333
A. 3. d.	241	The limits of the positive roots of $x^3 - qx + r = 0$.	R. F. Davis.	109
C. 1. f.	262	Note on Turning Valves.	E. J. Nanson.	287
C. 2. a.	247	Integration of $\frac{1}{\sqrt{x^2 - a^2}}$ and $\frac{1}{\sqrt{x^2 + a^2}}$.	G. H. Bryan.	129
C. 2. j.	248	The Solution of the "Christmas Cake" Problem.	G. H. Bryan.	130
D. 2. a. α.	258	Σu_n divergent when u_n/u_{n-1} can be expanded in a series of descending integral powers of n, beginning with $1 - \frac{1}{n}$.	F. J. W. Whipple.	281
D. 6. b.	223	Higher Trigonometry.	G. H. Hardy.	13
D. 6. b.	233	Modification of Stolz and Gmeiner's Method.	C. O. Tuckey.	21
D. c.	281	Note on Taylor's Theorem.	P. J. Harding.	332
D. c.	287	*v.* Note 281, p. 332.	A. Lodge.	390
I.	227	A certain pamphlet.	P. E. B. Jourdain.	15
I. 2. b.	249	Number of places in the periods of radix-fractions in scales other than the denary.	C. C. Wiles.	167
I. 2. b.	249	Numbers N, such that $1/N$, $1/N^2$, ... have same number of digits in scale of radix r.	Allan Cunningham, Lt.-Col. R.E.	209
I. 2. b.	253	Cf. Note 249, p. 167.	W. E. H.	230
J. 1. a. γ.	244	The Number of Homogenous Products.	F. J. W. Whipple.	128
K.	230	To prove Euc. 1. 27 without reversing the figure on itself or using superposition, and assuming nothing but Euc. I. 4 and 13.	C. A. Rumsey.	19
K. 1. c.	266	The Self-Reciprocal 13-gon.	C. O. Tuckey.	312
K. 1. c.	273	Note on Euclid 1. 32. Corollary.	A. A. Bourne.	318
K. 2. c.	243	Notes on the Nine-Point Circle.	W. Gallatly.	122
K. 2. c.	271	The polar circle of a triangle is cut orthogonally by the director circle of any inscribed conic.	A. C. Dixon.	317
K. 2. c.	272	Geometrical proof that the polar circle of a triangle is orthogonal to the director circle of the inscribed circle.	R. F. Davis.	317

Type.	No.	Subject.	Author.	Page.
K. 2. d.	264	Two Geometrical Proofs of Feuerbach's Theorem.	V. Ramaswami Aiyar. M. T. Naraniengar.	310
K. 2. e.	240	Linkage Problem.	P. J. Heawood.	108
K. 6. a.; 13. c.	256	On the area of a triangle, the equations of whose sides are given.	S. T. Shovelton.	231
K. 7. e.	231	Given two collinear sets of three points A, B, C and a, b, c, find α, β, γ in involution with both sets.	C. A. Rumsey.	20
K. 8.	255	On collinearity in complete quadrilateral.	W. Gallatly.	231
K. 9.	238	Geometrical Illustration of Pascal's Theorem.	R. F. Davis.	83
K. 9. b.	246	Note on a Chinese Theorem.	H. Bateman.	129
K. 20. e.	282	Trigonometrical Note.	E. J. Nanson.	333
K. 21.	279	Two approximate geometrical constructions for inscribing a Nonagon in a circle.	S. de J. Lenfestey.	330
K. 21. a. α.	284	Note on the problem: "Given a parallelogram, construct a parallel to a given line through a given point."	M. I. Trachtenberg.	334
L^1. 1. a.	225	The line at infinity, etc.	G. H. Hardy.	14
L^1. 1. c.	260	Pascal's Theorem.	J. J. Milne.	284
L^1. 2. b.	226	Morley's Problem.	A. C. Dixon.	15
L^1. 4. a.	263	Alternate proof of a standard theorem in Geometrical Conics.	W. P. Workman.	287
L^1. 17. e.	234	On a Certain Double Envelope.	R. F. Davis.	21
L^1. 17. e.	252	A Case of Double Contact.	P. N. Dutt.	211
L^1. 17. e.; K. 2. c.	265	The intersection of an in-conic and polar circle.	R. F. Davis.	311
L^1. 19. d.	251	Some properties of the Conic treated by other Methods.	P. N. Dutt.	210
L^2. 4. a.	236	The radius of the general right circular cylinder and the equation of its axis.	H. L. Trachtenberg.	23
L^2. 4. a.	275	A new method of finding the condition that the general conicoid should be one of revolution and of finding the equation of its axis.	H. L. Trachtenberg.	319
M^1. 8. g.	224	A curious imaginary curve.	G. H. Hardy.	14
M^4. c. a.	277	On the equation of a certain spiral.	Rodolphe Guimarães, Capt. R.E.	328
R. 4. a. α.	245	A proof of the Theorem that the vector-sum of the 'axes' of two couples is the 'axis' of their resultant.	R. F. Muirhead.	129

Type.	No.	Subject.	Author.	Page.
R. 6.	275	Change of Kinetic Energy due to Mutual Action of two Particles, and loss of Kinetic Energy by Collision.	A. L. Bowley.	327
R. 6.	288	*v.* Note 275, p. 327.	A. Lodge.	390
R. 6. a. β.	280	On the Kinetic Measure of a Force.	C. E. M'Vicker.	331
R. 7. a.	250	On a Solution.	J. M. Child.	167
R. 7. a. α.	232	A particle, attached to a fixed point by a string, moves in a vertical circle. If the string slackens, find where the particle meets the circle.	P. Scoones.	20
S. 1. b.	285	Stability of cube floating in liquid.	C. W. Adams.	388
T. 3. b.	242	Convenient Rules for Elementary Calculations as to Thin Lenses.	R. F. Muirhead.	110
V.	229	Contracted Methods.	A. Lodge.	17
V. a.	259	On Stolz and Gmeiner's Proof of the Sine and Cosine Series.	V. Ramaswami Aiyar.	282
V. a.	267	Supposing a^m be defined by the property $a^m \times a^n = a^{m+n}$, to prove $(a^m)^n = a^{mn}$.	G. P. Blake.	315
V. a.	278	Notation of Binomial Coefficients	W. F. Sheppard.	328
V. 1. a.	237	Contracted Multiplication and Division.	S. A. Saunder.	81
V. 1. a.	239	"Formulae" Problems.	W. Watson.	107
V. 1. a.	254	"Approximately equal to."	C. S. J.	231
V. 1. a.	286	*v.* Note 254, p. 231.	W. F. Sheppard.	389
V. 2. 10.	268	Historical Note (220, 221, 222).	J. J. Milne.	316
V. 4. b. β.	235	Graphical Solution of a Biquadratic.	W. H. H. Hudson.	22
V. 4. b. β.	269	On Note 235.	W. H. H. Hudson.	316
V. 4. b. β.	270	On the Intersections of the Limaçon and Quatrefoil used in the Graphical Solution of a Biquadratic.	W. H. H. Hudson.	316
X. 6.	228	A Mechanical Construction of Curves representing the Movement of a Pendulum.	C. S. Jackson.	15
X. 4. b.	257	On the Graphical Solution of Equations.	N. J. Clugnell.	232
X. 4. b. β.	261	Graphical Solution of a Biquadratic.	E. J. Nanson.	286

REVIEWS AND NOTICES.

Author.	Book.	Reviewer.	Page.
Ahrens.	*Briefwechsel Zwischen C. G. J. Jacobi und M. H. Jacobi.*	E. M. Langley.	269
Allen.	*Advanced Examples in Physics.*	C. S. J.	215
Andrews.	*Magic Squares and Cubes.*	W. W. Rouse Ball.	339
Baker.	*Algebraic Geometry. A New Treatise on Analytical Conic Sections.*	E. Budden.	91
Baker.	*An Introduction to the Theory of Multiple Periodic Functions.*	A. C. Dixon.	294
Barnard and Child.	*A New Algebra. Vol. I.*	J. J. Milne.	392
Blaschke.	*Vorlesungen über Mathematische Statistik.*	W. R. Strong.	83
Blaine.	*The Slide Rule.*	W. M. Roberts.	239
Bridgett.	*Blackie's Elementary Modern Algebra.*	J. J. Milne.	392
Briggs.	*Clive's Arithmetics for Scheme B.*	E. Budden.	90
Bromwich.	*An Introduction to the Theory of Infinite Series.*	A. Berry.	336
Bryan and Pinkerton.	*The Elements of the Geometry of the Conic; with a chapter on the Geometry of certain curves occurring in Applied Mathematics.*	G. B. Mathews.	215
Bôcher.	*Introduction to Higher Algebra.*	E. B. Elliott.	291
Cantor.	*Vorlesungen über Geschichte der Mathematik.*	W. J. G.	399
Carslaw.	*Fourier's Series and Integrals.*	G. H. Bryan.	390
Clarke.	*Practical Mathematics.*	W. M. Roberts.	394
Cowan.	*Blackie's New Concentric Arithmetics.*	E. Budden.	91
Cowlishaw.	*Examples and Homework in Preliminary Mathematics.*	E. Budden.	90
Davison.	*Algebra for Secondary Schools.*	J. J. Milne.	392
Davison and Richards.	*Plane Geometry for Secondary Schools.*	F. S. Macaulay.	164
Denning.	*Five Figure Mathematical Tables.*	E. M. Langley.	340
Doehlmann.	*Projective Geometrie in Synthetischer Behandlung.*	E. M. Langley.	134
Douglas.	*Modern Commercial Arithmetic.*	E. Budden.	90
Fazzari.	*Breve storia della Matematica.*	E. M. Langley.	270
Fiedler.	*Analytische Geometrie der Kegelschnitte nach Georg Salmon.*	E. M. Langley.	271
Fine.	*A College Algebra.*	P. E. B. Jourdain.	85
French and Osborn.	*Elementary Algebra.*	J. J. Milne.	392
French and Osborn.	*Graphs.*	E. M. Langley.	133
Galle.	*Geodäsie.*	C. S. J.	112

Author.	Book.	Reviewer.	Page.
Geissler.	*Anschauliche Grundlagen der Mathematischen Erdkunde.*	E. M. Langley.	271
Gibbs.	*The Scientific Papers of.*	E. T. W.	87
Godfrey & Siddons.	*Modern Geometry.*	J. Milne.	338
Gunther.	*Integration by Trigonometric and Imaginary Substitution.*	C. S. Jackson.	340
Hall.	*Clive's Mathematical Tables.*	E. M. Langley.	268
Harley.	*Biographical Sketch of R. Rawson.*	E. M. Langley.	240
Hermite.	*Œuvres. Vol. II.*	W. J. G.	399
Heun.	*Lehrbuch der Mechanik.*	C. S. Jackson.	87
Hilton.	*An Introduction to the Theory of Groups of Finite Order.*	W. Burnside.	335
Jackson and Milne.	*A First Course in Statics.*	G. H. B.	85
Jeans.	*Theoretical Mechanics.*	C. S. Jackson.	111
Johnson.	*A Treatise on the Integral Calculus, founded on the Method of Rates.*	G. H. Hardy.	307
Lambert.	*Computation and Mensuration.*	C. S. J.	395
Lampe and Parisius.	*Guido Hauck.*	E. M. Langley.	136
Leathem.	*Examples in the Mathematical Theory of Electricity and Magnetism.*	C. S. J.	215
Lock and Child.	*Trigonometry for Beginners.*	E. Budden.	92
Loria.	*Vorlesungen über darstellende Geometrie.*	C. S. Jackson.	165
Loria.	*Il Passato ed il Presente delle principali Teorie Geometriche.*	W. J. G.	341
Macaulay.	*Geometrical Conics.*	G. B. Mathews.	215
Martin.	*Text-book of Mechanics.*	C. S. Jackson.	92, 240
M'Elwee.	*Geometrical and Projective Sketching.*	R. B. P.	24
Mercer.	*Trigonometry for Beginners.*	E. Budden.	92
Minchin and Dale.	*Mathematical Drawing.*	E. M. Langley.	133
Montessus.	*Leçons élémentaires sur le Calcul des Probabilités.*	C. S. J.	395
Netto.	*Gruppen und Substitutionentheorie.*	H. Hilton.	397
Osgood.	*A First Course in the Differential and Integral Calculus.*	G. H. Hardy.	307
Paterson.	*School Algebra. Part I.*	J. J. Milne.	392
Peek.	*La Formule* $\phi = re^{\iota(\phi+\iota\psi)}$ . . .	F. S. Macaulay.	215
Picard.	*Œuvres de Charles Hermite, publiées sous les Auspices de l'Académie de Sciences.*	W. J. G.	399
Pionchon.	*Principes et Formules de Trigonométrie Rectiligne et Sphérique.*	E. M. Langley.	268
Randall.	*Elements of Descriptive Geometry.*	E. M. Langley.	132
Rogel.	*Das Rechnen mit Vorteil.*	E. M. Langley.	271

Author.	Book.	Reviewer.	Page.
Ross.	*Elementary Algebra for the use of Higher Grade and Secondary Schools.*	J. J. Milne.	392
Saxelby.	*An Introduction to Practical Mathematics.*	W. M. R.	395
Schreibner.	*Beiträge zur Theorie der Linearen Transformationen.*	E. B. E.	293
Schubert.	*Auslese aus meiner Unterrichts-und Vorlesungspraxis.*	E. M. Langley.	135
Schultze.	*Graphic Algebra.*	W. M. R.	395
Scoones and Todd.	*The Eton Algebra. Part I.*	J. J. Milne.	392
Scott.	*Cartesian Plane Geometry.*	F. S. Macaulay.	163
Shepard.	*Problems on Strength of Materials.*	C. S. Jackson.	340
Slocum and Hancock.	*Text-Book on the Strength of Materials.*	W. J. G.	136
Smith and Gale.	*Introduction to Analytic Geometry.*	E. Budden.	91
Stuyvaert.	*Cinq études de géométrie analytique.*	F. S. M.	341
Stuyvaert.	*Les Nombres positifs. Exposé des théories modernes de l'arithmétique élémentaire.*	P. E. B. Jourdain.	340
Tarry.	*Tablette des Cotes relatives à la base 20580 des facteurs premiers d'un nombre inférieur à N et non-divisibles par 2, 3, 5, ou 7.*	A. Cunningham, Lieut.-Col., R.E.	112
Taylor.	*A System of Applied Optics.*	W. B. Morton.	38
Teixeira.	*Obras sobre Mathematica. Vols. I. and IV.*	W. J. G.	398
Tuckey.	*Examples in Arithmetic, with some Notes on Method.*	E. Budden.	90
Veblen and Lennes.	*Introduction to Infinitesimal Analysis.*	P. E. B. Jourdain.	88
Voss.	*Über das Wesen der Mathematik.*	P. E. B. Jourdain.	396
Weber, Wellstein and Weber	*Encyclopädie der Elementar-Mathematik. Vol. III.*	C. S. Jackson.	165
Whitehead.	*The Axioms of Projective Geometry.*	F. S. M.	287
Whitehead.	*The Axioms of Descriptive Geometry.*	F. S. M.	287
Mathematical Instruments.		W. J. G.	309
The Schoolmaster's Year Book and Directory.		W. J. G.	342
The Public Schools' and Preparatory Schools' Year Book. The Girls' School Year Book.		W. J. G.	342

QUERIES AND ANSWERS.

Queries.	Page.	Queries.	Page.	Answers.	Page.	Answers.	Page
No. 1	94	No. 31	166	No. 1	102		
2	94	32	166			No. 32	272
3	94	33	166	3	102		
4	94	34	166			34	235, 236
5	94	35	212				
6	95	36	212	6	131		
7	95	37	212	7	212		
8	95	38	212	8	102, 131	38	237, 295
9	95	39	212	9	131, 213	39	238, 296
10	95	40	212	10	132, 213, 234		
11	95	41	212			41	238
12	95	42	212	12	104	42	238
13	95	43	212			43	239, 342
14	95	44	212	14	132	44	239
15	130	45	212				
16	130	46	212			46	239
17	130	47	212				
18	131	48	212				
19	131	49	233	19	166		
20	131	50	295				
21	131	51	295				
22	131	52	295	22	213	52	320
23	131	53	295	23	166, 213		
24	165	54	295	24	214		
25	165	55	295	25	214		
26	166	56	295				
27	166	57		27	214		
28	166			28	214, 235		
29	166	59	342	29	215		
30	166	60	342				

ERRATA.

Pages 136, 239, 343, 400.

SOLUTIONS.

By E. M. Radford. Nos. 63, 68, and 75.

PAGE
272
, 236
, 295
, 296
238
238
, 342
239
239
320